CLAIMS:

1. An isolated nucleic acid sequence, which encodes for a polypeptide with neuronal tryptophane hydroxylase activity, selected from the group of:
a) a nucleic acid sequence with the sequence depicted in SEQ ID No: 1, SEQ ID No: 3 or SEQ ID No: 5 (DNA-sequence from human, mouse, rat),
b) nucleic acid sequences, which can be deduced from the nucleic acid sequences depicted in SEQ ID No: 1, SEQ ID No: 3 or SEQ ID No: 5 as a consequence of the degenerated genetic code,
c) derivatives of the nucleic acid sequences depicted in SEQ ID No: 1, SEQ ID No: 3 or SEQ ID No: 5, which encode for polypeptides according to SEQ ID No: 2, SEQ ID No: 4 or SEQ ID No: 6 (amino acid sequences from human, mouse, rat), which display at least 80% homology at the amino acid level, wherein the biological activity of the polypeptides is not significantly reduced,
d) a human genomic nucleic acid sequence, which contains the gene for sn-TPH and exhibits polymorphisms.

2. Polypeptide, encoded by a nucleic acid sequence according to claim 1.

3. Polypeptide according to claim 2, specified by the sequence depicted in SEQ ID No: 2, SEQ ID No: 4 or SEQ ID No: 6.

4. Recombinant nucleic acid molecule containing a nucleic acid sequence according to claim 1 or parts of this nucleic acid sequence, wherein the nucleic acid sequence is connected in an anti-sense or sense-direction with one or several regulatory signals.

5. Vector containing a nucleic acid sequence according to claim 1 or a recombinant nucleic acid molecule according to claim 4.

6. Recombinant prokaryotic or eukaryotic host organism containing at least one nucleic acid sequence according to claim 1 or at least one recombinant nucleic acid molecule according to claim 4 or at least one vector according to claim 5.

7. Recombinant prokaryotic or eukaryotic host organism according to claim 6, wherein this organism is a microorganism or an animal.

8. Use of a polypeptide according to claim 2 or of peptide fragments thereof as an antigen for the production of specific polyclonal or monoclonal antibodies or antibody mixtures directed against polypeptides according to claim 2 or 3.

9. Polyclonal or monoclonal antibody or antibody mixtures, which recognise specific polypeptides according to claim 2 or 3.

10. A method for isolating a compound that binds to the polypeptide according to claim 2, comprising:
(a) contacting a mammalian cell which expresses the polypeptide of claim 2 having sn-TPH activity with a compound;
(b) detecting the presence of the compound which binds to the sn-TPH polypeptide, and
(c) determining, whether the compound binds said sn-TPH polypeptide.

11. A method for the production of a pharmaceutical composition comprising the steps of the process according to claim 10 and the subsequent step of formulating the compound identified in step (c) and/or its pharmaceutically acceptable salts in a pharmaceutically acceptable form.

12. A method for the treatment of neuronal diseases, characterised in that the serotonin production is increased or decreased by affecting the snTPH-activity.

13. Method for the treatment of neuronal diseases according to claim 12, characterised in that the serotonin production is increased by a tissue-specific overexpression of snTPH, by the addition of the precursor substance 5-hydroxy-tryptophane or by the addition of substituted analogues of 5-hydroxy-tryptophane.

14. Method for the treatment of neuronal diseases according to claim 12, characterised in that the serotonin production is decreased by ribozymes, by antisense-

oligonucleotides, by antisense-RNA-expression or by means of specific TPH-inhibitors like p-chlorophenylalanine or p-ethinylphenylalanine.

15. A method for determining the pharmacogenetic properties of a pharmaceutically active compound, comprising a) administering the compound to a mammal, b) determining the level of expression of snTPH in a biological sample obtained from said mammal, and c) comparing said level of expression of snTPH with a level obtained from a control sample.

16. Method for the improved treatment of a disease, comprising performing the method of claim 15, and increasing or decreasing the doses of the pharmaceutically active compound to be applied to said patient.

17. Method according to claim 16, wherein the disease is selected from neuronal disease, such as sleep disturbances, anxiety, alcoholism, drug abuse, disorders of food uptake and/or sexual disorders.

18. Use of a sequence according to claim 1 or of a protein according to claim 2 or 3 for the treatment of sleep disturbances, anxiety, alcoholism, drug abuse, disorders of food uptake or sexual disorders, characterised in that the serotonin level is affected by modulating the gene expression of snTPH.

19. A method for diagnosing a neuronal disease, characterised in that a specific inhibition of the peripheral serotonin biosynthesis is accomplished, followed by subsequently detecting the metabolite concentrations stemming from the CNS and by determining the severity of the disease via a comparative graph.

20. Use of a nucleic acid sequence according to claim 1, of a recombinant nucleic acid molecule according to claim 4 or of a polypeptide according to claim 2 or 3 for identifying/discovering proteins, which have specific binding affinities for a polypeptide according to claim 2 or for identifying nucleic acids, which encode for proteins having specific binding affinities for a polypeptide according to claim 2 or 3.

21. Use according to claim 20, characterised in that the Two-Hybrid-System is employed.

22. Use of a nucleic acid sequence according to claim 1 or a fragment thereof for the isolation of a genomic sequence by means of homology screening or as a marker for human hereditary diseases.

23. Use of a nucleic acid sequence according to claim 1, a recombinant nucleic acid molecule according to claim 4 or a fragment of these for gene therapy.

24. Use of a DNA-sequence according to claim 1 or of a polypeptide according to claim 2 or 3 for affecting the serotonin level via specific regulation of the snTPH-activity/amount.

25. Combination therapeutic comprising a polypeptide according to claim 2 or 3 and at least one additional protein, in particular for the regulation of the serotonin metabolism.

26. Combination therapeutic according to claim 25, characterised in that the additional protein is a peripheral tryptophane hydroxylase.

27. Combination therapeutic according to claim 26, characterised in that the peripheral and the neuronal serotonin production are simultaneously increased or decreased.

28. Use of the combination therapeutic according to any of claims 25 to 27 for the treatment of bleeding episodes in the psycho-pharmacological treatment of depressions with antidepressants, which affect the serotonin reuptake-transporter, containing antidepressants and von Willebrand-factor.